

1 **Amendment to the Claims**

2 **In the Claims:**

3 Please cancel Claims 45-48.

4 Please amend Claims 1, 8, 16, 29, 31, 33, 34, 36, 37, 39, and 40 as follows:

5 1. (Currently Amended) A method for identifying a specific cell, to enable a determination
6 to be made as to whether the specific cell corresponds to a known cell type, wherein the known cell
7 type relates to the viability of the cell, comprising the steps of:

8 providing spatial frequency content data from a side scatter image of the known cell type;

9 directing incident light at the specific cell, using a detector to obtain the side scatter image of
10 the specific cell;

11 calculating the spatial frequency content data of the side scatter image of the specific cell by
12 computing a standard deviation of individual pixel intensities within the side scatter image of the
13 specific cell; and

14 comparing the spatial frequency content data of the side scatter image of the specific cell to
15 the spatial frequency content data of the side scatter image of the known cell type to determine if the
16 specific cell corresponds to the known cell type.

17 2. (Previously Presented) The method of claim 1 wherein there is relative motion between
18 the specific cell and the detector.

19 3. (Previously Presented) The method of claim 1 wherein the specific cell identified is
20 contained within a heterogeneous cell population, and side scatter image data is collected for the
21 heterogeneous cell population.

22 4. (Original) The method of claim 1 wherein the specific cell identified is an apoptotic cell.

23 5. (Original) The method of claim 4 wherein the apoptotic cell is an early stage apoptotic cell
24 or a late stage apoptotic cell.

25 6. (Original) The method of claim 1 wherein the specific cell identified is a necrotic cell.

26 7. (Original) The method of claim 1 wherein the specific cell identified is at least one of an
27 apoptotic cell and a necrotic cell.

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1 8. (Currently Amended) A method for identifying a specific cell, to enable a determination
2 to be made as to whether the specific cell corresponds to a known cell type, wherein the known cell
3 type relates to the viability of the cell, comprising the steps of:

4 providing spatial frequency content data from a brightfield image of the known cell type;
5 directing incident light at the specific cell, using a detector to obtain the brightfield image of
6 the specific cell;

7 calculating spatial frequency content data of the brightfield image of the specific cell by
8 computing a standard deviation of individual pixel intensities within the brightfield image of the
9 specific cell; and

10 comparing the spatial frequency content data of the brightfield image of the specific cell to the
11 spatial frequency content data of the brightfield image of the known cell type to determine if the
12 specific cell corresponds to the known cell type.

13 9. (Previously Presented) The method of claim 8 wherein there is relative motion between
14 the specific cell and the detector.

15 10. (Previously Presented) The method of claim 8 wherein the specific cell identified is
16 contained within a heterogeneous cell population, and brightfield image data is collected for the
17 heterogeneous cell population.

18 11. (Original) The method of claim 8 wherein the specific cell identified is an apoptotic cell.

19 12. (Original) The method of claim 11 wherein the apoptotic cell is an early stage apoptotic
20 cell or a late stage apoptotic cell.

21 13. (Original) The method of claim 8 wherein the specific cell identified is a necrotic cell.

22 14. (Original) The method of claim 8 wherein the specific cell identified is at least one of an
23 apoptotic cell and a necrotic cell.

24 15. (Original) The method of claim 8 wherein the spatial frequency content is of the nucleus.

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1 16. (Currently Amended) A method for identifying a specific cell, to enable a determination
2 to be made as to whether the specific cell corresponds to a known cell type, wherein the known cell
3 type relates to the viability of the cell, comprising the steps of:

4 providing an image of the known cell type that has been marked with a single nuclear marker;
5 providing spatial frequency content data from the image of the known cell type that has been
6 marked with the nuclear marker;
7 contacting the specific cell with the nuclear marker;
8 directing incident light at the marked specific cell;
9 using a detector to obtain an image of the marked specific cell;
10 calculating spatial frequency content data of the image of the marked specific cell by
11 computing a standard deviation of individual pixel intensities within the image of the marked specific
12 cell; and

13 comparing the image of the marked specific cell and [[a]] the spatial frequency content data of
14 the image of the marked specific cell to the marked image of the known cell type and the spatial
15 frequency content data of the marked image of the known cell type to determine if the specific cell
16 corresponds to the known cell type.

17 17. (Previously Presented) The method of claim 16 wherein there is relative motion between
18 the specific cell and the detector.

19 18. (Previously Presented) The method of claim 16 wherein the specific cell identified is
20 contained within a heterogeneous cell population, and image data is collected for the heterogeneous
21 cell population.

22 19. (Original) The method of claim 16 wherein the specific cell identified is an apoptotic
23 cell.

24 20. (Original) The method of claim 19 wherein the apoptotic cell is an early stage apoptotic
25 cell or a late stage apoptotic cell.

26 21. (Original) The method of claim 16 wherein the specific cell identified is a necrotic cell.

27 22. (Original) The method of claim 16 wherein the specific cell identified is at least one of
28 an apoptotic cell and a necrotic cell.

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1 23. (Previously Presented) The method of claim 16 wherein a single nuclear marker is used,
2 the single nuclear marker and the spatial frequency content of the image enabling one to classify the
3 specific cell as one of the following cell types:

4 a viable cell having a cellular membrane that is impermeable to the nuclear marker;

5 a cell in an early stage of apoptosis and which has a cellular membrane that is
6 impermeable to the nuclear marker;

7 a cell in a late stage of apoptosis and which has a cellular membrane that is permeable
8 to the nuclear marker; and

9 a necrotic cell which has a cellular membrane that is permeable to the nuclear marker.

10 24. (Previously Presented) The method of claim 23 wherein the single nuclear marker is
11 7-aminoactinomycin D.

12 25. – 28. (Cancelled)

13 29. (Currently Amended) A method for classifying a specific cell as one of the following
14 four types of cells, a viable cell, a necrotic cell, an early apoptotic cell in which a cellular membrane
15 of the cell is still intact, and a late apoptotic cell in which the cellular membrane of the cell is not
16 intact, using only a single nuclear marker and image data from the cell, the method comprising the
17 steps of:

18 exposing the specific cell to only a single nuclear marker that will bind to DNA in a
19 nucleus of the cell in the event that the cellular membrane of the cell is not intact;

20 collecting image data from the specific cell;

21 using the image data of the specific cell to determine [[a]] spatial frequency content
22 data of a side scatter image of the specific cell by computing a standard deviation of individual pixel
23 intensities within the side scatter image of the specific cell; and

24 analyzing the image data of the specific cell and the spatial frequency content data of
25 the side scatter image of the specific cell to classify the cell as one of a viable cell, a necrotic cell, an
26 early apoptotic cell, and a late apoptotic cell.

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1 30. (Previously Presented) The method of claim 29 wherein the step of analyzing determines
2 that the specific cell is a viable cell, when:

3 the image data indicates that the nuclear marker has not crossed the cellular
4 membrane; and

5 the spatial frequency content of the side scatter image of the specific cell corresponds
6 to a previously determined spatial frequency content of a side scatter image of a viable cell.

7 31. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
8 that the specific cell is a viable cell, when:

9 the image data indicates that the nuclear marker has not crossed the cellular
10 membrane; and

11 the spatial frequency content data of the side scatter image of the specific cell does not
12 correspond to a previously determined spatial frequency content data of a side scatter image of an
13 early apoptotic cell.

14 32. (Canceled)

15 33. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
16 that the specific cell is a cell in an early apoptotic cell when:

17 the image data indicates that the nuclear marker has not crossed the cellular
18 membrane; and

19 the spatial frequency content data of the side scatter image of the specific cell does not
20 correspond to a previously determined spatial frequency content data of a side scatter image of a
21 viable cell.

22 34. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
23 that the specific cell is a cell in an early apoptotic cell when:

24 the image data indicates that the nuclear marker has not crossed the cellular
25 membrane; and

26 the spatial frequency content data of the side scatter image of the specific cell
27 corresponds to a previously determined spatial frequency content data of a side scatter image of an
28 early apoptotic cell.

29 35. (Canceled)

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1 36. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
2 that the specific cell is a late apoptotic cell when:

3 the image data indicates that the nuclear marker has crossed the cellular membrane;
4 and

5 the spatial frequency content data of the side scatter image of the specific cell
6 corresponds to a previously determined spatial frequency content data of a side scatter image of a late
7 apoptotic cell.

8 37. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
9 that the specific cell is a late apoptotic cell when:

10 the image data indicates that the nuclear marker has crossed the cellular membrane;
11 and

12 the spatial frequency content data of the side scatter image of the specific cell does not
13 correspond to a previously determined spatial frequency content data of a side scatter image of a
14 necrotic cell.

15 38. (Canceled)

16 39. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
17 that the specific cell is a necrotic cell when:

18 the image data indicates that the nuclear marker has crossed the cellular membrane;
19 and

20 the spatial frequency content data of the side scatter image of the specific cell does not
21 correspond to a previously determined spatial frequency content data of a side scatter image of a late
22 apoptotic cell.

23 40. (Currently Amended) The method of claim 29 wherein the step of analyzing determines
24 that the specific cell is a necrotic cell when:

25 the image data indicates that the nuclear marker has crossed the cellular membrane;
26 and

27 the spatial frequency content data of the side scatter image of the specific cell
28 corresponds to a previously determined spatial frequency content data of a side scatter image of a
29 necrotic cell.

30 41. – 48. (Canceled)